GRAIN

ELEVATOR OPERATION AND MAINTENANCE

NOVEMBER • 1938

I'm Glad I've Lived

Contributed

I'm glad I've lived!
If I were to die before tomorrow —
And if, before I died,
Everything were taken from me,
And my friends betrayed me, and I were
forced to endure
The utmost shame and heartbreak,
I'd still say —
"I'm glad I've lived —
"Whatever it costs,
"Life is worth while!"

★

As a matter of fact,
Like every normal human
Who's old enough to come
In out of the rain,
I have endured most of these things
In some measure.
And at first, I'll confess,
I raised an awful rumpus about it.
"What's the use of going on?" I cried,
"If I've got to be sick and poor?
"What's the use of trying
"If your friends betray you?
"What's there left to live for
"When the one you loved is dead?"

★

That's how I talked at first —
For, being young and ignorant,
I thought that life meant only
What happened to me,
And how I felt about it;
And if I weren't happy,
Then life was a flop.
And, naturally,
As long as I felt that way
Life *was* a flop for me.
For it's plain to see
That in a world as crowded as this,
As bristling with conflict,
And competition,
And disappointment and accident,
It's obviously impossible
For things to happen to suit
Any one person's convenience.
And as long as I insisted
On hogging the spotlight,
Life was bound to be
Just one sock in the jaw
After another.

★

But after many years of socks —
Twenty, thirty, forty,
More than fifty years of socks —
I began to see that life
Had bigger concerns than my happiness,
Or anyone's personal happiness.
I began to see that life was concerned
With the great and endless adventure of growing;
Races growing — spirits growing —
And that the mishaps that came
To me and everyone
Were just part of the program
Of growing.
And I realized that life,
However it happened,
Was a great show.
If it held ugliness,
It also held beauty.
If it held lies,
It also held truth.
If it held death,
It also held birth.
And who could tell which was which?

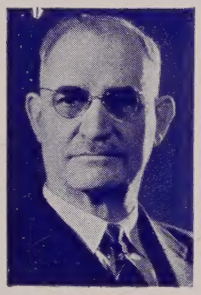
★

But you didn't need to tell —
You didn't need to judge —
All you needed to enjoy life
And profit by it,
Was to get outside yourself
And see life as a show,
Taking things as they came,
Realizing that everything was important,
And sacred, and mysterious,
Whether it made you happy or not . . .
That's why I'm saying
I'm glad I've lived!
It was all worth while,
No matter what the cost.
Maybe I didn't get the breaks I wanted,
But just being born is the biggest break
Anyone can have!

Editorial

By T. C. MANNING

First Vice President, Superintendents' Association, and Superintendent, Uhlmann Grain Company, Kansas City, Missouri



GRAIN

BOARD OF TRADE BUILDING
CHICAGO, ILLINOIS
TELEPHONE WABash 3111-2

A forum for OPERATIVE and MECHANICAL PROBLEMS in TERMINAL ELEVATORS

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TOLERANCE

Webster defines it:

"Power, capacity, or act of enduring; endurance."

"A disposition to tolerate opinions, beliefs, practices, or conduct differing from one's own; freedom from bigotry, toleration."

Fine. Let us, then, take these one by one:—

POWER OF ENDURING: Strength of character.

CAPACITY FOR ENDURING: Mental ability.

ACT OF ENDURING: Patience.

ENDURANCE: The ability to suffer pain, hardship or distress without being overcome.

A DISPOSITION TO TOLERATE OPINIONS, BELIEFS, PRACTICES OR CONDUCT DIFFERING FROM ONE'S OWN: Understanding and respect for *all mankind.*

FREEDOM FROM BIGOTRY: Generosity. Reasonableness.

TOLERATION: Combining all the above virtues.

And so what have you? . . .

A strong, intelligent, patient, human, generous, reasonable HUMAN BEING—one able to see the other fellow's point of view dispassionately.

A LIKED person. An ADMIRABLE person. A WORTHWHILE person.

In short . . . A *REAL* PERSON.

Where would you be —

if your ELEVATOR

EXPLODED

for

SAFETY PROTECTION IMPROVEMENT

Install

The New DAY DUST CONTROL SYSTEM

2938
PILLSBURY AVENUE

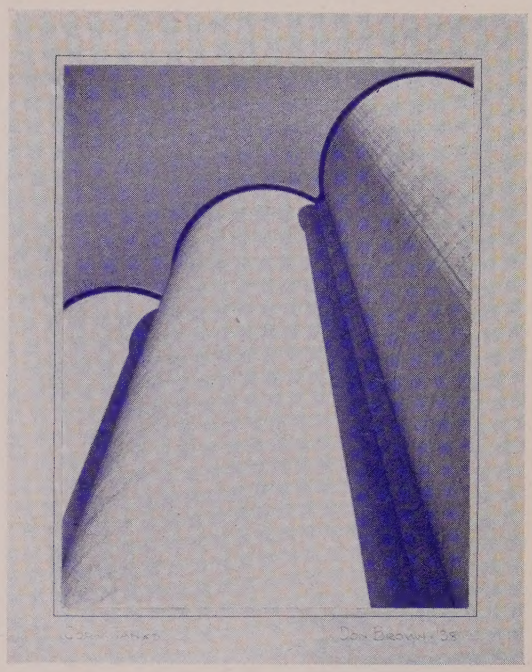
THE DAY CO.

MINNEAPOLIS,
MINNESOTA

Water in the Bins

By — Edgar S. Miller,
Technical Editor,
THE NORTHWESTERN MILLER

★



Men as closely associated with flour milling as are superintendents of grain elevators are fully aware of the importance to the operative miller of the moisture content of the wheat he is to mill. They are also keenly aware of the fact that the moisture contained in wheat and other grains has a good deal to do with the behavior of that grain in storage, affecting its "condition" and being responsible, when high, either for considerable damage or for a great deal of manipulation to prevent damage. It is also known that the percentage of moisture in wheat varies even when stored in bins which will not permit any appreciable amount of water, either in the form of vapor or liquid, to enter, and, altogether, there seems to be an element of mystery in the behavior of stored grain that excites interest and challenges investigation.

There are plenty of reasons for the significance of the water content of grains. The wheat berry, in common with all things endowed with life, lives actively only in the presence of water. During its development, its solid constituents are conveyed by water and deposited where each belongs, and it is well known that even when all are in place, and the construction job is otherwise finished, the final phase consists of disposing of a quantity of liquid water exceeding in weight all the other constituents. Only a short time before harvesting takes place those substances which may later be transformed into another growing plant, or which may be converted into food for mankind unless decay or vermin of one kind or another get them first, are the chief ingredients (in point of value) of a soft dough. After the excess water is disposed of they go together to form a comparatively dry mass having a density greater than water and in which life is dormant.

Moisture Not Stationary

Concerning this dehydrating process, we say simply that the grain "dried out." It is readily understood that the water was "evaporated" — that is, it was changed from a liquid to a vaporous state and expelled into the surrounding air, but probably it isn't often that any great amount of thought is given to the nature of the phenomena involved, notwithstanding that such phenomena are not only most important to the existence of all life but are particularly significant in connection with the preservation and utilization of the cereal grains. Let us have just a brief look at these phenomena.

Water is changed from a liquid to a vapor only through the agency of heat. We must remember, however, that **heat** and **temperature** are not the same, else we may be confused by the drying up of cold water — even ice — by cold air. Heat must be considered as a form of energy, while temperature is merely a measure of one of the activities of heat. Another of its activities has to do with the imparting of energy to the molecule of water, which in the liquid state may be considered very close together. When heat is converted to energy and that energy is applied to the job of forcing water molecules apart, pressure is developed. If this pressure is greater than any in opposition, a unit of liquid will expand to about 1,600 times its original size, and vapor is formed.

In the field, atmospheric air not only receives this vapor and carries it away, but it also imparts the major portion of the heat the water absorbs. "Drying out" may thus occur in the absence of high temperatures if great quantities of air pass over the wheat heads, simply because in great quantities of air there is always a great quantity of heat under any conditions imposed upon us by nature. High winds are "drying," then, for two reasons; first they provide heat necessary for the vaporization of water when it does not come from another source; and, second, they offer, even when not so very "dry," a place for the expelled vapor to go.

Now let us consider what happens to a wheat berry or a berry of any of the other grains after it is harvested. If the process of dehydration, or "drying out," resulted in a moisture content of, say 10%, and if means were provided to insure against the absorption of any moisture, it would be a natural supposition that grain would be in a truly dormant state, and would remain so, with very little deterioration, for some years. There is a large chance, however, that such a supposition would be proved wrong. Why? That is really a very long and complicated story, and no adequate explanation could be made here even if it were within my power to make it. Let us have just one guess, however, and that a brief one.

The Inside Wet Spots

It is altogether reasonable to hold that when any body — a grain of wheat or a chunk of clay destined to become terra cotta — is dried by the application of heat to the outsider there will come a time when the **average** moisture content is much lower than that of an area far removed from the surface. It took the engineer a long time to account for the fact that when huge pieces of clay were dehydrated by the use of hot, dry air, warping and cracking followed, but he eventually learned that the trouble was caused

by the later action of moisture virtually sealed in the center of the piece.

Now if it is true that something like this occurs during the ripening of wheat, and there is within the grain after harvest a little spot with a moisture percentage much higher than the average for the entire berry, worse things are likely than could possibly happen to an inert lump of clay. Endosperm which has been dried down to 10% or 12% moisture is exceedingly strong, and the danger of warping is not great, but if we give a little thought to the behavior of the constituents of the endosperm when they are in the presence of excess moisture, some real dangers are discovered.

Without going deeply into the matter, let us remember that chemical activity occurs in damp grain. In the little wet spot are the elements carbon, hydrogen and oxygen in organic form. A certain amount of free oxygen is also present in the contained air, and since conditions favorable to the combining of carbon and oxygen, with the formation of carbon dioxide, are provided, such combination takes place, with the evolution of heat. This heat stimulates further activity, and when there is no escape for it, as is the case when the grain is confined in a bin, with the air surrounding the berries stagnant and limited in quantity to the volume of the interstices, it soon accumulates. Increased temperature follows, and this in turn is followed by increased activity.

A highly significant phase of the procedure is the combining of hydrogen with oxygen, with the formation of water. One carbon atom combining with two atoms of oxygen form carbon dioxide and produce heat; two hydrogen atoms combining with one atom of oxygen form the oxide of hydrogen, plain ordinary water — also with the production of heat. To put it shortly, a little too much water sealed in a spot within a grain of wheat starts chemical activity which not only destroys some of the grain's constituents but also results in temperature rise and an actual increase in the amount of water present.

Wiping Away Sweat

A great deal has been said about the "sweating" of grain, by growers, grain men, millers, flour technologists and even bakers, but apparently the thing remains more or less mysterious, since the few attempts that have been made to explain it are not in very close agreement. I am not presumptious enough to do more than wonder if there may not be some connection between it and a situation such as I have suggested.

Following this line of thought, it is easy to believe that recondensation of vapor expelled from the berry really forms the "sweat" about which we have heard so much. There is only one way by which it may be disposed of, and that is by causing it to vaporize into air again and be carried away. This occurred quite readily when wheat was stacked, for even slow-moving winds usually can penetrate a wheat stack properly made. Little difficulty was experienced, either, in the days when grain was spread over the floor of a granary or barn to only a depth of a few feet. It is something else again when wheat is harvested by modern methods and almost immediately stored in bins which are in effect "air tight."

Of course, "sweating" is not the only nor the most frequent cause of grain heating and spoilage. All normal grain is continually going through a process of absorbing oxygen and giving off the products of combustion — very, very slowly when the contained moisture is small and the temperature is low but increasing at a tremendous rate when, for any reason, moisture and temperature increase. Excess moisture stimulates activity which in turn produces heat, and the actual manufacture of water from the constituents of the wheat berry is easily possible.

The remedy is to prevent any accumulation of heat, which means that unless means are provided for forcing large quantities of air through the grain as it reposes in the bins the grain itself must be taken to the air. This is accomplished by "turning" — that is, by drawing grain from a full bin, elevating it and sending it through machines which will "aspirate," or aerate it before it is deposited in another bin.

Elevator operatives know all about this, and everyone at all concerned with the storing of grain under present-day conditions appreciates that the operative cannot afford to move wheat continually from one bin to another with a view to avoiding any possibility of trouble. Yet, experience has taught that "hot when grain is left undisturbed and unspots" develop quickly in the grain mass aerated. Under such circumstances there are, of course, accumulations of heat which cannot escape. As has already been suggested, heat begets heat — and possibly produces water which helps along in the process — and if nothing is done to prevent it, temperatures high enough to ruin some of the grain for milling are often brought about.

"Blotting Paper" Wheat

Most modern establishments receiving and storing grain have their bins equipped with a thermomtric system through which the operative can ascertain from one central point — in his office, for example — the temperature prevailing at virtually any spot in any bin at any time. If he must depend upon "turning" for aspiration, or aeration, he is relieved from turning unnecessarily, and if the bins have means for accomplishing forced aeration, as a good many have, the apparatus can be used not at all or lightly, as circumstances warrant in this bin or that, permitting strong aeration in bins containing grain that comes in "out of condition" or on the point of becoming so.

The findings of certain research that has been carried on, together with an attempted explanation of the theories involved, may be of some interest. Grain with a temperature close to that of the prevailing weather is not likely to lose any appreciable amount of moisture in close storage — remembering, of course, that if "heating" in even a slight degree begins, the temperature of some of the berries will be increased. On the other hand, under some conditions of atmospheric moisture and temperature, wheat in a bin a hundred feet high and 25 feet in diameter may absorb moisture from the atmosphere. The reason is that the constituents of the berries have a certain attraction for water. Which is to say that these constituents attract water in something of the same way that a piece of blotting paper does. They hold on to this water tenaciously, and cannot be made to behave like sand, for example, from which all moisture can be driven by the introduction of sufficient heat. We do not actually **know** the true moisture content

of any of the grains or their products, because when we try to measure it by weighing "damp and dry," long before the last vestige of liquid water has been converted to vapor and driven off by heat, the carbohydrates are broken down and new water is formed. Of course, when great quantities of air are brought in contact with the surfaces of the berries, some of the contained water may receive sufficient heat to cause some evaporation and some loss of moisture, but always the vapor pressure of the internal moisture is opposed by the molecular attraction mentioned.

What's To Be Done?

On the other hand, wheat in a closed bin, or in the hold of a cargo vessel, can and often does absorb water condensed from water vapor carried in air even if the temperature of the grain is as high or slightly higher than that of the surrounding air. If molecular attraction is stronger than the vapor pressure of the moisture already contained in the berries, some of the exterior vapor will be condensed and absorbed, just as is the case when calcium chloride steals moisture from air and increases in temperature. Condensation is accompanied by "shrinking" of the vapor to about one sixteenhundreth of its former size, of course, and it is conceivable that a slight vacuum would exist in the bin if no air could enter. Some air can enter, notwithstanding that we have called the bin "air tight;" and because this is so, water vapor in sufficient quantity to raise the moisture of the grain appreciably is made available for condensation and absorption.

It is well known that wheat shipped across the ocean, or on the Great Lakes, is often damper upon unloading than it was when loaded. To speculate as to the probable reasons for this may at least be interesting. Incidentally, the same theories fit in nicely with the known fact that rather dry grain sometimes takes moisture from rather damp air, condensing the vapor and holding the heat involved as heat instead of absorbing heat and immediately losing it as latent heat of vaporization. It is all a matter of balance of pressures, and this balance is a very delicate one. When it is perfect, we say that "equilibrium moisture conditions" prevail, but when there is even a slight lack of balance it is more than just a little difficult to measure all factors and set them down in figures. Nevertheless, it is probably worth while to know something about general trends, and it is not improbable that here is a large opportunity for study and development that will make applicable certain scientific methods of considerable monetary value to the grain and milling industries.

★

UNHAPPY RELATIONS

Says Manager

Reluctance to ask your boss to place you in the Superintendents' Society is really doing both him and the business an injustice!

The ten dollars he pays for your dues and the carfare to attend your annual conventions should be returned to him many times over in good ideas that the business investments will be one of his most profitable.

Why hesitate? Ask him to join today! The four hundred and eight other Superintendents that have joined can't be wrong — and the number is growing almost weekly.

★

HIS SHOULDER TO THE WHEEL

I suppose a fellow needs subscribers for a "mechanical publication" as well as for any other. I hope that later on you will have a million or two. Right now, of course, I am going to put my shoulder to the wheel in your behalf. Therefore, put my name down on your list and tell me how many "bucks" I should send you.

Somehow the Superintendents' conventions always manage to come around at the time when I am working pretty hard for a living and of course I can't get away. H. K. Holman, Senior Marketing Specialist, Bureau of Agricultural Economics, U. S. Department of Agriculture, Washington, D. C.

ON THE FACE OF THE EVIDENCE

Courtesy Chicago Daily News

GOPHER CHAPTER INSPECTS PLANT

Says PAUL CHRISTENSEN, Monarch Elevator Company, Chapter President

Throwing their plant wide open for a minute inspection by our members, The Strong-Scott Manufacturing Company were recently our hosts. For two hours the eighty-five present watched skilled mechanics shape conveyor boxes and heavy sheet metal spouting, and fabricate equipment used in the handling of grain and provender.

A hearty "Dutch" lunch preceded Mr. H. Hardman's remarks relative to storing wheat upon which federal loans had been made. "Delivery must be of the same grade," he pointed out, "the same class, subclass and protein content within one-half a percent. Charges for turning are to be paid by the government."

A discussion of mechanical problems concluded the meeting.

★

NUMBER OF ACCIDENTS DOUBLE

The number of accidents among those grain and provender plants entered in the Superintendents' Association Safety Contest doubled during October, according to Safety Director Clarence Turning of Duluth. One was a severe injury resulting in the loss of a finger.

★

TWO SAFETY TROPHIES

Two swell Safety trophies are to be awarded to the winners of the Superintendents' Association contest at their annual convention in Milwaukee next April 3-5. Why not compete yourself?

SAFETY DRIVE SPREADING TO SAMPLERS

Says President E. J. RAETHER, Omaha

Little did we realize when our Superintendents' Association inaugurated its Safety drive that it would become so spontaneous.

Latest body to come forth with safety suggestions is the USDA in their October Grain Inspectors' Letter outlining hazards to be encountered in sampling grain.

A copy is available for those interested by writing 1108 Post Office Building, Chicago.

E. J. RAETHER

★

"TAKEN FOR A RIDE"

Falling on a grain belt—only to be carried some distance and thrown on the concrete floor—resulted in several injured vertebrae to an elevator workman recently.

★

WELCOME VISITOR

We were honored on November 2nd to receive a visit from Mr. G. L. Parsons, President and General Manager of the Goderich (Ont.) Elevator & Transit Company Ltd. He displayed a very interesting chart showing how 31 winter storage grain boats are moored in their commodious basin and how they are shunted around almost like toys for unloading operations after navigation closes.

Mr. Parson insists that loading houses, particularly those on the water, can and should do a much better job in screening out such dangerous objects as car boards, spikes, bolts, iron pipe, chain and chain hooks, wrenches and tools of various kinds, and sundry other articles, which cause a great deal of unloading delay. Lying unseen until some damage occurs, or accumulating in the inner lofting boots of unloading elevators, the expense incurred and time lost in repair and replacements of damage truly runs into a lot of money annually.

INTO HOLD

Slipping and falling backwards as he was pulling a rope to adjust a spout, an experienced grain trimmer landed on a steel half-deck part way down the hold.

★

A WET TWISTER

Henry Korn had a most unusual experience at the Superior Elevator in Buffalo recently. It seems a tall pile of limestone on the opposite dock slid into the slip with such force that Henry's two marine legs — which were busily engaged unloading the S. S. "Tomlinson" were badly twisted by the young tidal wave. The damage is going to cost $25,000 to repair.

★

NEW MEMBERS JOINING

Reports Gilbert Lane

As Second Vice-President of the Superintendents' Association it is my pleasant duty to report new members joining throughout the year, — and I am only too happy to do so.

Latest welcome additions to the official roles of the Society are:

404 — Frank A. Crombie, Continental Grain Company, Chicago, (obtained by William H. Gassler, Rosenbaum Brothers, Chicago);

405 — Earl Gravatt, Kansas City Millwright Company, North Kansas City, (obtained by National Vice President T. C. Manning, Uhlmann Grain Company, Kansas City);

406 — Ralph A. Wilson, Swift and Company, Champaign, (obtained by Earl R. Evans, Evans Elevator Company, Champaign);

407 — O. A. Halberg, Pillsbury Flour Mills Company, Springfield, (obtained by Harold Wilber, A. E. Staley Mfg. Company, Decatur).

Before the end of this year we will print a list of all members joining in 1938. Will your name be on it?

GILBERT LANE

PLENTY OF "UMPH"

According to Dean A. A. Potter of Purdue University, the power available in North America is the equivalent of more than 400 human slaves for each of the 35,000,000 families in this country.

★

FAST HOPPERS

Grasshoppers hop fast, field experiments in North Dakota this season indicate. J. A. Munro, entomoligist of the North Dakota Agricultural College, painted a lot of grasshoppers red and turned them loose. Within ten days specimens of the decorated insects were picked up as much as 300 miles away.

★

KANSAS CITY WIVES TURN OUT

Reports FRANK A. WILSON

The Kansas City Chapter of the Superintendents' Association had a dandy meeting the last of October when the Supers and their wives met at the Woodhill Clubhouse in North Kansas City.

It was not a business meeting and we just had a good time with fine entertainment and a good dinner. The consensus of opinion is that we should have more meetings where the wives are taken along.

★

SO MONTREAL IS HAPPY

Grain exports through Montreal to November 1st increased 54% over those of last year. Of the total of 81,582,588 bushels shipped to overseas market this season, 31,408,000 bushels were from "the states," the largest shipment of U. S. grain through this harbor in at least ten years.

HIGH GRAIN TARIFFS BREED WAR

Condemning high tariffs and the restriction of international grain trade in his booklet "Plenty and Peace," Clarence Henry, Director of Education of the Chicago Board of Trade, sets forth that such a policy is in part responsible for current dangers of European war.

"Every effort is being made by our former customers, the 'self-sufficiency' nations, to add grain surplus producing territory to their domains to meet our announced plans of depriving them of access to our supplies by reducing our production. North Americans have too much, with a price too low, because of trade restrictions, whereas Europeans lack bread because the same barriers make the price too high. Current wheat prices would have been sustained but for the fact that we penalize our customers over 50% when they desire to settle for their purchases by shipping us goods of their own production. Practically, our import tariff amounts to a sales tax on our exports.

"Countries which were former customers of the North American farmer are enforcing strict control of bread grains, while European families go hungry in an attempt to get along without our supplies. Meanwhile our wheat producer is considering plans to adjust his production to make permanent his loss of the European market.

"Although many believe that our standards of living benefit from high tariffs that restrict foreign competition, tariffs but block the road to world markets to which the farmer's production is geared; tariffs lower the farmer's living standards by restricting his trade opportunities; tariffs, too high, cause low farm prices.

International trade is not computed in wage scales and living standards but rather in goods," Mr. Henry points out, "for labor efficiency and amount of production spells the difference between creative comforts, food standards and general life among the various countries.

"Grains are the most domestic commodities in the world, and at the same time the most international. They are so necessary as to sustain the arts of peace that they are a most frequent cause of international friction, often leading to war."

(Ed. Note: A complete report is available from Mr. Henry's office.)

★

SEZ ZEKE WISEACRE

The long-head Super ponders in October that the next month is November — leaving only 65 days to git his Christmas shopping debts accumerlated.

BE VERY SURE!

Be sure to keep records on all employees subject to the Federal Fair Labor Standards Act! Hours must be recorded by the day and by the week so as to be easily inspected.

★

EXPLOSIONS CHECKED

According to recent studies, dust explosions are impossible if the oxygen content is kept below 12% through introducing carbon dioxide.

★

BAD ODDS

99 persons are disabled by accident or illness to every one who dies. No wonder hospitals are so busy.

★

FILLS A NEED

Thank you for the copy of "GRAIN." It certainly hits the point and reflects the ability of your staff to give the trade something which I believe there is a big field for, practical facts. Walter Florine, Rollins-Burdick-Hunter Company, Chicago.

★

WHO SHALL MANAGE?

Henry Ford says:

"A monopoly of jobs in this country is just as bad as a monopoly of bread!"

In an effort to dictate the management of the Ford industry, Mr. Ford puts it this way:

"If union leaders think they can manage an automobile factory better than we can, and pay better wages under better working conditions than we can, why don't they build a factory of their own and show us up? They have the capital — they have all the money they need and a lot more. The country is big; they have the men; and think of all the union customers they would have!

"If the union leaders are sincere, they should go into business themselves. If they have thought out a better way to manage business, let them demonstrate what it is. If they can't do that, why do they pretend they can?"

There are two groups attempting the control of labor, one distinctly more radical than the other. Industry will incline to the one that has not adopted communistic ideals and contempt for private ownership.

FRANK THEIS IN S. A.

Frank A. Theis, President of Simonds-Shields-Lonsdale Grain Company, Kansas City, and an honorary member of the Superintendents' Association, dropped in on Brazil recently, giving rise to rumors that a trade of U. S. wheat for Brazilian coffee might result.

★

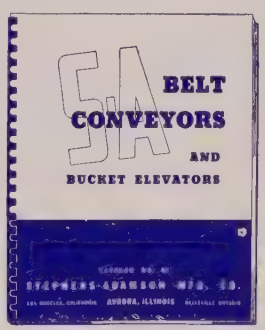
YOU BET IT PAYS

An Arkansas woman advertised for a husband. She got one at a cost of $9.00. He enlisted in the army and was killed. She got $3,000 insurance and a widow's pension for the rest of her life. Yet, some will tell you that advertising does not pay! — Typo Graphic.

★

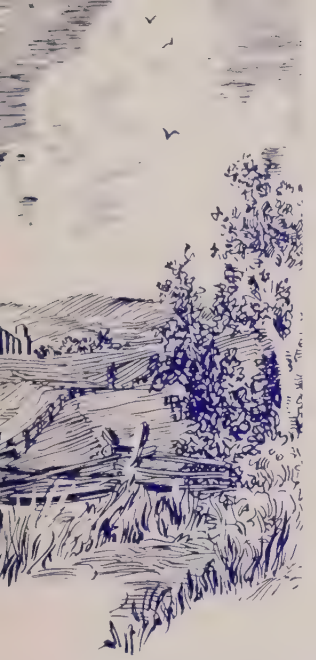
HOT OFF THE PRESS

A comprehensive textbook for those interested in belt and bucket conveyors — **and who isn't** — is just being made available by Stephens-Adamson of Aurora, Ill. Among other valuable features are a series of condensed tables for estimating belt conveyor speeds, widths, and capacities; horsepower requirements for conveying materials horizontally, as well as power requirements for the elevation and lowering of materials; conveyor design, operation, specifications, etc. Also shows all types of belt conveyor accessories.



The manufacturers are to be congratulated on the character of this book which will be found highly valuable to all recipients requesting a copy. The conveyors described include not merely a variety of units for handling bulk materials but a variety of operations.

In addition, a second text is just announced as Catalog 68, showing operation of their four types of combined speed-changers and speed-reducers, which, by special arrangement, can vary the rotation past zero into reverse direction. A differential shaft permits the input power to be divided, part at constant speed through the differential, the remainder through the variable speed mechanism.



Power Outlet for Surplus Grain

By
VICTOR H. SCHOFFELMAYER
Dallas, Texas

Nearly five thousand gallons of power alcohol is being made daily in a $500,000 plant at Atchison, Kansas, financed largely by the Chemical Foundation, Incorporated, of New York. Corn, rye, grain sorghums, artichokes, sweet potatoes or blackstrap molasses are used for this "Agrol,"—a coined word from the first syllable of "agricultural" and the last of "alcohol."

IT is the country's first important demonstration of a farm chemurgic industry, giving farmers a brand new source of cash income and pointing the way to the restoration of lost markets for grain grown on some 30,000,000 acres of land in the corn belt when automobiles, motor trucks and tractors displaced some 10,000,000 horses and mules on the farm and in towns. In other words, autos, trucks, and tractors could be made to eat the equivalent of the grain and feed which farm workstock formerly consumed by blending with gasoline at least ten per cent of anhydrous ethyl grain alcohol, which would give the farmer an assured market for some 700,000,000 bushels of corn or its equivalent.

The consumption of gasoline is estimated at some twenty billion gallons annually. A ten per cent blend motor fuel would call for two billion gallons of agricultural alcohol. Since a bushel of corn or grain sorghums produces approximately two and one-half to three gallons of alcohol it will be seen that there looms a market for about the same quantity of grains which the displaced horses and mules ate.

Cost To Come Down

In the operation of the Atchison "Agrol" plant there has been used largely grain sorghums grown within a radius of fifty miles or more. Farmers have been receiving 85¢ per hundred pounds of grain sorghums and 52¢ a bushel for number two yellow, white or mixed corn. Most recent cost sheet shows that at Atchison it costs about 22.3¢ a gallon to manufacture. In a short time, as volume and demand increase, the cost of making this fluid will be further lowered largely through the two valuable byproducts from grain used in the process, a cattle feed containing up to thirty-five per cent protein and averaging twenty-eight to thirty pounds from a bushel of grain, and carbon dioxide (dry ice) which is being used at Atchison and Kansas City to refrigerate shipments of perishable vegetables, fruits and other farm products.

The Atchison Agrol Company was made a reality through the direct aid of the Chemical Foundation of New York through the efforts of the late Francis P. Garvan, its president. He gave large sums to the Farm Chemurgic Movement, which came into existence in May of 1935 at Dearborn, Michigan, to solve agricultural problems through applied science and research. Agriculture, science and industry were to co-operate for their common good and the "Agrol" is the first important contribution made by the Farm Chemurgic Movement to bridge the gap between Agriculture and Industry.

The Chemical Foundation invested some $350,000 in the Atchison "Agrol" plant and the total investment to date approximates $500,000, some paid in by small stockholders on nearby farms. Monthly income of the plant is now placed at $50,000. It produces 4,500 gallons of anhydrous ethyl grain alcohol a day and distributes it in fifteen midwest and northern states. More than 2,000 filling stations in Nebraska, Kansas, Iowa, South Dakota, Minnesota, Colorado, Oklahoma, Arkansas, Texas, Maryland and Wyoming are selling the new motor fuel which is to give farmers a new source of badly needed income.

Scientific claims made for "Agrol" are that it improves standard grades of gasoline when blended with these in a ratio of anywhere from five to seventeen per cent. The slower combustibility of alcohol is said to give smoother engine performance, absence of carbon, gummy accretions and knock, greater mileage.

HIGH GRADE CONCRETE FACTS

Because concrete expands and contracts it should have adequate compressive strength;

It should be resistant to rain, frost, and rapid climatic changes;

It should be impermeable to water;

It should be resistant to chemical action, and

It should withstand abrasion and mechanical damage.

An impermeable concrete is better able to withstand the ravages of the elements and aggressive factors in the industrial field.

★

SICK WHEAT AGAIN

"Sick" wheat promises to be the current bugaboo of grain plant Superintendents, due, according to the USDA Grain Inspectors' Letter, to the harvest rains.

"A good percentage of farm stored wheat has gone bad, and much more will become weevilly, begin heating, and go musty because of high moisture and inadequate facilities on the farms for turning and general care.

"The more moisture in wheat the more active will be the natural respiration of the berries, and when damp wheat is left in deep storage long enough without aeration the kernals will in time have absorbed practically all of the oxygen present in the air surrounding the kernels and as a result partly or wholly lose their power to germinate."

We hope no "sick" Supers are to be added to the "sick" farmers (when they discover their plight) and the "sick" wheat.

★

PARADE OF EXPLOSIONS CONTINUES

Ceaselessly, persistently, steadily parading on and on, the columns of dust explosions push destructively foreward with only a rare gap in their death-dealing onslaught. One shudders to guess what the gory details of the next report will be.

Latest to be sorrowfully added to this year's heavy toll is the Pillsbury elevator at Enid, Oklahoma, at 9:30 a.m., Sept. 17. The explosion blew off the tops of two concrete bins, zipped open the concrete walls of the two tanks and the interstice nearly to the bottom, then thundered out a portion of the conveyor gallery wall over the tanks.

The machinery had just been started to bin some wheat. Had the gallery not been so well ventilated or the elevator not kept so clean the blast would have been much more costly. Fortunately there was no one injured nor was there any fire resulting.

KEEPING ALIVE

It is natural to wonder at change. Natural, at least, for an outsider who does not realize that business is a process of change, with a steady current of new ideas being digested, and new formulas coming into clash with someone's pet idea.

Business, as well as people, tries to keep up with the Jones'. Always there is something ahead.

So, day by day, our business houses are outwardly orderly and quiet, but internally are seething with ideas and problems. Every day every employee gains a little ground or loses a little favor. Every day some long-established brand is shrinking a little in popularity and some new item is moving ahead.

The duty of the man at the top is to recognize these trends and to change in time.

When you see an Elevator where the Super has been at the top for many years, you know he is a man who has grown with the times and has adapted himself to each era.

He is **ALIVE.**

★

HOPE HE'S RIGHT

Thank you very much for sending copy of your excellent publication.-Bert D. Ingels, Wallace & Tierman Company, Inc., Newark, N. J.

PERENNIAL WHEAT

Experiments to develop a type of perennial wheat are being conducted in Canada by officials of the National Research Council and the Department of Agriculture of the federal government. It is expected that even if the main object is not achieved, valuable new types of forage plants of great value to agriculture will be developed.

Dr. L. E. Kirk, Dominion agrostologist and chief of the forage plant division in the Department of Agriculture, states that the project of developing a perennial wheat was begun two years ago and since then it has been vigorously prosecuted on a rather extensive scale.

About 20,000 cross pollinations were made in 1935 and about 50,000 in 1936, both in the greenhouses under artificial light during the winter months and in the field during the summer. About a dozen species and varieties of wheat and an equal number of species of grains were used.

There still remains a great deal of work yet to be done before the desired objectives are reached, Dr. Kirk emphasizes.

A wide range of hybrid material is on hand from which selections can be made and it is at present impossible to predict just what types of plants out of this material will be found most suitable and useful. It is believed, however, that these crosses between wheat grasses may easily result in new types of forage plants of great value to agriculture.

It is altogether likely that perennial wheat can be obtained also, but it seems rather doubtful whether wheats which will measure up to the high standards of quality, which are required in Canada, will be attained.

—Cargill News

★

THE TILL'S RINGING

It is with pleasure that I am sending you two new subscribers to "GRAIN" for which I enclose $2 together with my own subscription.-John S. Bush, Portsmouth, Ontario.

★

WITHOUT INDUSTRY

Picture if you can how desolate our city would be without its Industrial Activity. No busy clank of presses nor whir of machinery; no smoke rolling skyward from our chimneys.

Yet that would be but half the drab picture, for without our Industries our city could not carry on its other activities. Stores and Banks would close their doors for want of customers. Schools, parks, hospitals, libraries could not operate without the funds business and industry pours into the public coffers, through taxation. Our citizens would be compelled to abandon their homes and seek a livelihood elsewhere.

That is why it pays all of us to do everything within our power to help preserve the prosperity of these vital institutions in our community—to keep our working conditions so favorable and our reputation for fairness and cooperation so unblemished that industries will continue to thrive and expand.

Harmony in our relations with one another is the basis for prosperity and progress. Help promote good will toward our industries and you help promote the best interests of all.

★

DAILY BREAD TERRIBLE?

Some Badminton bread tokens were recently on sale at a London salesroom, states **The Miller** of that leading metropolis. These are a relic of the bread riots of the late eighteenth century, and were made to commemorate the part played by the then Duke of Beaufort to combat the corn shortage. On them was inscribed "One shillingsworth of bread, three and a half pounds, Good Lord deliver us."

SOREL SETS RECORD

Setting a record for yearly grain shipments, Sorel, Quebec port on the St. Lawrence River, eclipsed their 1936 all-time "high" of 24,339,053 bushels early in October. Almost half of the 84 ocean-going ships to clear from Sorel this year have been of German registry.

★

CAUSE FOR SWELLED HEAD

We congratulate you on the publication "GRAIN" and wish you all kinds of success. — J. M. Adam, Anheuser-Busch, Inc, St. Louis.

★

ANOTHER BOUQUET

Thank you for the copy of "GRAIN." I have found this publication very interesting and you are indeed to be complimented upon same. I will be interested in receiving copies each month. — M. W. Lightcap, Maintenance Service Department, Pittsburgh Plate Glass Company, Pittsburgh, Pa.

★

A HORSE ON HIM

Anne Nex: How dare you eat the grass in my front yard!

Beggar: Well, Ma'am, I haven't eaten a thing in three days.

Anne Nex: Oh, you poor man! Come right into the back yard where the grass is much higher.

★

QUICK, WATSON . . . !

Korn: How can you tell when a fellow isn't playing square?

Wete: When he's playing around.

★

THUMBS DOWN!

Chicago Chapter's President, Gil Lane, tells the one about the mute in the deaf and dumb school who sprained a thumb yelling, "FIRE!" during a recent conflagration.

★

BOW — WOW!

"Of course, dogs have intelligence," Superintendent Oatclipps declared warmly. "Now, here is Ella Vator, she's a lover of dogs, and I'll leave it to her whether dogs haven't more intelligence than their masters." "Yes, indeed," responded Ella heartily. "I have several dogs at home like that!"

★

SEA?

Red: I hear the sea captain's wife ran away.

Winter: Yep, he took her for a mate and she turned out to be a skipper.

★

RESEARCH FOR GRAIN OUTLETS STARTED

Four Federal laboratories will be established the first of the year (endowed with a million dollars annually apiece) to be devoted to research looking toward the development of new uses of farm products in industry.

★ ★

The Answer to Your Need for Capital

— is very likely to be found right in your present inventory of grain or grain products, which you can use in part as the basis for a Field Warehouse by Douglas-Guardian, set up right on the premises. Capital will be made available almost immediately and on favorable terms.

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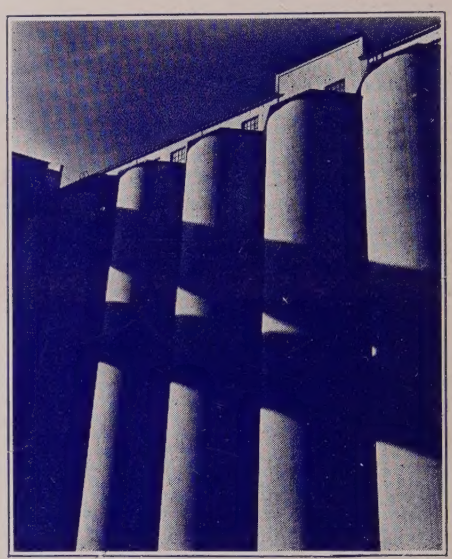

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